USDA NRCS
Natural Resources Conservation Service

Conservation Management System (Cropland)

Alabama Guide Sheet No. AL 2

What is a Conservation Management System*?

A Conservation Management System on cropland is a combinations of conservation practices and management that allows for the use of the cropland in a way that meets the landowner's/user's objectives while protects the resources and the environment on and off the farm. Conservation Management Systems on cropland vary depending on slope, climate, soil erosiveness, soil texture, and other soil characteristics.

Resource Concerns Related to Cropland

Resource concerns in cropland include: soil erosion, soil quality, and deposition.

Soil Erosion

Soil erosion is the wearing away of the soil surface by wind or water. Loss of the surface soil reduces the productivity of the soil. Some erosion is unavoidable when soils are used to produce crops; however, conservation management systems minimize this erosion to a level that will not reduce the productivity of the soil for the future.

Soil Quality

Soil productivity is also dependent on the soil quality. Poor soil tilth, insufficient organic matter, compaction or soil contaminants can significantly reduce yields and increase costs of production.

Deposition

Eroding soil particles settle into depressions within the field or continue to flow into streams, rivers, or lakes. This sediment can damage crops, fill in ditches, terraces, and other conservation practices or fill in water bodies damaging fish and other aquatic species.

Cropland Conservation Management Systems

Traditional row-crops in Alabama are cotton, peanuts, corn, soybeans, and grain sorghum. Conservation Management Systems for row-crops combine structural, residue, and vegetative practices to minimize impacts of rain on the soil surface and safely carries the water run-off from the field, improves soil quality and reduces impacts on the environment.

Essential Practices

Four practices are essential to all cropland conservation management systems—crop rotation, residue management, nutrient management, and pest management. Crop rotation and residue management is a combination of crops and cultural practices that maintain or increases the soil organic matter and improves soil quality. Nutrient management is the application of nutrients needed by the crop(s) at levels that are environmentally safe. Pest management is the application of pesticides according to their label recommendation to minimize impact on the environment.

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* Conservation Management System is also referred to as a Resource Management System in the National Planning Procedures Handbook.

Conventional Tillage System

Terraces, grassed waterways or underground tile outlets, field borders, crop rotation, crop residues and cover crop management, contour farming, nutrient management, and pest management. The combination of terraces and grassed waterways or outlets carries the run-off water safely to the edges of the field reducing the risk of concentrated flow or gully erosion. Field borders provide for efficient turning of equipment and catches sediment. Retaining crop residues or planting of cover crops protects the soil during the winter from sheet and rill erosion. Contour planting of the crop allows each row to carry water safely to edges of the field also reducing sheet and rill erosion.

Conservation Tillage System

No-till, strip till, ridge till or mulch till, terraces/ diversions, grassed waterways, crop rotation, field borders, crop residues and cover crop management, nutrient management, and pest management. Conservation Tillage significantly improves soil quality. No-till provides the highest level of protection of the conservation tillage methods, because only a small slit in the residue is made during planting. Strip, ridge and mulch tillage allows for more soil disturbance, but still provides a high level of surface protection during heavy rains. The combination of terraces or diversions and grassed waterways or underground outlets protects the field from concentrated flow or gully erosion. Field borders provide for efficient turning of equipment and catches sediment.

Contour Buffer System

Contour buffer strips, grassed waterways, field borders, crop rotation, crop residues and cover crop management, contour farming, nutrient management, and pest management. This system of grassed buffers strips and grassed waterways can be used with conventional or conservation tilled crops between the strips. The retention of crop residues or planting of cover crops protects the soil during the winter from sheet and rill erosion. Contour planting of the crop allows each row to carry water safely to edges of the field also reducing sheet and rill erosion. The system of vegetative buffers slows the run-off water and the grassed waterways safely carry it off the field reducing the risk of concentrated flow or gully erosion. Field borders provide for efficient turning of equipment and catches sediment.

Grass Base Rotation System

Grass and Legume planting, terraces/diversion, grassed waterway, field borders, crop residues and cover crop management, nutrient management and pest management. Perennial grasses and legumes planted for a minimum of two years in rotation with crops two or less years provide a conservation management system that protects the soil and significantly improves soil quality. The terraces or diversions and grassed waterways provide safe removal of excess water run-off. Field borders provide for efficient equipment turning. The grasses and legumes in the system can also provide forage for livestock.

Other associated practices to these systems might be gully control structures—where caving type gullies threaten the field, or water supplies (ponds, troughs, etc.) and fencing where the field is included in the farm grazing plan.

Potential Effects of Conservation Management Systems on Cropland

- Reduces sheet, rill, and gully erosion
- Improves soil tilth and organic matter
- Maintains or improves soil productivity
- Improves moisture holding capacity of the soil
- Reduces soil compaction and crusting
- Reduces the amount of sediment entering streams, rivers, and lakes
- Reduces risk of groundwater or surface water contamination from nutrients or pesticides.

References

Alabama Guide Sheets related to this Conservation Management System are: AL 329A, 329B, 329C, 344, 386, and 412.